

## **Attachment 1: Glove boxes Design Description and Containment and Ventilation Controls**

### **Proposed Changes**

Make the following clarifications regarding the glove boxes:

- There are three gloveboxes in the small scale treatment laboratory instead of two;
- Modify text in Volume 11, Part XIV.4, Section 3.3.7.9 to more accurately describe the containment and ventilation controls for the glove boxes located in the small scale treat unit;
- Update the design description of the gloveboxes

### **Rationale**

The proposed changes are necessary because of the following: Providing better clarifications regarding LLNL's original intention to always to have three glove boxes; Clarifies how the containment and ventilation controls associated with the glove boxes work; and Provides a better design description of the glove boxes.

### **Proposed New Text: Inert Atmosphere, Radioisotope and Combination Hazards Glove Boxes**

There are three glove boxes (inert atmosphere, radioisotope and combination hazards glove boxes) which provide containment and ventilation controls for treating and handling small quantities of waste. Emissions from the radioisotope and the combination hazards glove box can either pass through dedicated HEPA filters through the use of built-in blowers before entering the POGS or they can enter the POGS and by-pass the dedicated HEPA filters through the use of vacuum pumps. The inert atmosphere glove box uses a vacuum pump to direct any emissions to the POGS.

Typically, the wastes treated in a glove box present high-airborne contamination hazards (e.g., asbestos, carcinogens, radioisotopes) or require an inert atmosphere, although other wastes may be treated as well. For example, the water reactor is operated in the inert atmosphere or the combination hazards (in inert atmosphere mode) glove box, and the mercury amalgamator or the pressure reactor can be operated in any one of the three glove boxes as appropriate. The radioisotope and the combination hazards (in radioisotope mode) glove boxes are equipped with blowers for adjusting the internal pressure. The inert atmosphere and the combination hazards (in inert atmosphere mode) use vacuum pumps for adjusting the internal pressure.

The inert atmosphere and the combination hazards glove boxes are equipped with a regenerative drying train to allow air-sensitive materials to be safely treated and handled. The drying train for the combination glove box is only used when the glove box is in the inert atmosphere mode. The regenerative drying train removes trace oxygen and moisture permeating through surfaces and leaking through gaskets and seals of the glove box. The regenerative drying train consists of an electrically heated copper catalyst and a molecular sieve. The heated catalyst removes trace amounts of oxygen and the molecular

sieve removes water vapor. To ensure the regenerative drying train is maintaining an inert atmosphere, the moisture and oxygen content of the internal atmosphere are monitored with a dew point and oxygen sensor.